
Customized Brain Cells for Stroke Patients Using Pluripotent Stem Cells.

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Public Summary:

Regenerative medicine in stroke involves therapies that induce tissue repair and recovery. This is a distinct approach from reducing stroke damage: restoring blood flow, reducing cell death, or limiting secondary progression of injury. These 3 areas have a very concise or limited focus: restoring blood flow involves lysing or removing clots. Reducing cell death means neuroprotection. Limiting secondary damage involves modulating process of inflammation or delayed apoptosis. In contrast, tissue regeneration after stroke relates to many potential therapeutic targets, such as enhancing angiogenesis, neurogenesis, or gliogenesis; promoting axonal sprouting; stabilizing injured synaptic connections; or modulating excitatory/inhibitory balance in brain circuits. Single molecular targets may promote 1 specific tissue repair process, but clinical success is likely to occur if many of these reparative events are stimulated by 1 therapeutic treatment. This concept has informed the stem cell field in stroke. In experiments with transplantation of stem/progenitor cells in stroke, tissue repair can occur through direct formation of or replacement to neurons or glia, production of growth factors and cytokines, and stimulation of the cellular progenitors that lead to angiogenesis, neurogenesis, and gliogenesis.

Scientific Abstract:

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